

Liquid Animal Waste Sampling

Karl VanDevender
Extension Agricultural
Engineer

John Langston
Extension Agricultural
Engineer

Liquid animal waste sampling can be an important management tool. Proper sampling provides the producer with nutrient analysis results that can be used in a sound farm fertilization program. Nutrient analysis of waste, in conjunction with soil sampling, helps producers determine how much waste should be applied to fields and pastures to maintain adequate fertility while minimizing potential environmental problems such as ground and surface water pollution. Using nutrient analyses to manage application of liquid waste can also reduce farm fertility costs by reducing the amounts of commercial fertilizer inputs.

When to Sample

Liquid animal waste should be sampled for nutrient analysis as close to land application time as possible. This helps ensure that the waste is adequately mixed and that nutrient content accurately reflects what is being applied to the land. If the waste is being sampled as it is being land applied, the results will not be available to govern present application rates. It does, however, provide a good analysis for future land applications of animal waste if the waste management system remains fairly constant over time. Follow application rates in your waste management plan until sufficient data can be collected from your waste storage facility to justify different application rates. If you want to apply

animal waste at rates other than those specified in your waste management plan, your site management plan must be modified and approved by the Department of Pollution Control and Ecology (DPC&E) prior to using the alternative application rates.

How to Collect a Liquid Sample

During Land Application

The safest and easiest way to collect liquid animal waste samples is to collect the waste as it is being land applied. The waste samples are fairly well mixed and best represent the amount of nutrients applied to the land for crop use. Randomly place catch pans in the field to collect the liquid waste as it is land applied by an irrigation system or honey wagon. Immediately after the waste has been applied, collect the waste from the catch pans, combine in a bucket to make one composite sample and mix well by stirring. Take the final sample from this mixture, and fill a one liter plastic bottle half full. These bottles may be obtained from your county Extension agent. Never fill the bottle more than half full to allow for gas expansion of the sample and to prevent the bottle from exploding. Keep the samples frozen or as cold as possible until you can take them to your county agent or ship them to a laboratory.

*Arkansas Is
Our Campus*

Visit our web site at:
<http://www.uaex.edu>

Sampling waste in this manner accounts for nutrient losses due to both storage and handling as well as losses due to application. Loss of nutrients may occur after land application due to volatilization, denitrification, leaching and runoff. These losses should be accounted for when determining actual nutrient applications for crop growth.

From a Storage Facility

If collecting liquid animal waste samples during land application is not possible, collect the samples from the storage facility. Samples may be collected by attaching a container, such as a jar or milk jug, to a long rod and removing a sample of waste. If at all possible, the waste in the storage facility should be well-agitated prior to waste sampling to ensure a well-mixed sample. Liquid animal waste storage facilities have a tendency for the waste to stratify with the solids settling to the bottom and the liquids remaining on top. This stratification causes a change in the nutrient profile of the waste in the storage facility. The nitrogen and potassium will be more concentrated in the top liquid, while the phosphorus will be concentrated in the bottom solids.

Several samples should be collected from the storage facility, placed in a bucket to make a composite sample and mixed well by stirring. From this mixture, fill a one liter plastic bottle half full. Once again, never fill the bottle more than half full to allow for gas expansion. To prevent further nutrient loss, freeze the samples immediately. Samples

collected in this manner will not account for nutrient losses due to storage and handling or land application losses.

If you plan to have your samples analyzed by the University of Arkansas, take the samples to your county Extension agent. The agent will help you in filling out an information sheet on your manure sample and will ship the samples to the laboratory. There is a cost for sample analysis. You also have the option of sending your waste samples to a private laboratory. If you are required by the Department of Pollution Control and Ecology (DPC&E) to sample your liquid animal waste as part of your liquid animal waste permit, you must have the sample analyzed for pH, total nitrogen (N), ammonium ($\text{NH}_4\text{-N}$), phosphorus (P), potassium (K) and percent solids. Refer to Fact Sheet FSA 3008, *Understanding Your Animal Waste Nutrient Analysis*, for information on how to interpret your waste analysis results.

The important things to remember in collecting a liquid animal waste sample are:

1. Collect a sample that best represents the nutrient content of the waste in that storage facility.
2. Keep the sample cold.
3. Ship the sample to the lab as soon as possible.
4. Observe all safety precautions when collecting animal waste samples.

ANGELA RIECK, former assistant specialist - waste management, is co-author of this publication.

This publication was funded in part by the University of Arkansas Cooperative Extension Service, the Environmental Protection Agency and the Arkansas Soil and Water Conservation Commission.

DR. KARL VANDEVENDER and JOHN LANGSTON are Extension agricultural engineers, University of Arkansas Cooperative Extension Service, Little Rock.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director, Cooperative Extension Service, University of Arkansas. The Arkansas Cooperative Extension Service offers its programs to all eligible persons regardless of race, color, national origin, religion, gender, age, disability, marital or veteran status, or any other legally protected status, and is an Equal Opportunity Employer.